Application No. 10/790,403
Filed: March 1, 2004
TC Art Unit: 2822
Confirmation No.: 1449

IN THE CLAIMS

Please **amend** claims 24 and 26 and **cancel** claims 1-12 and claims 27-31 without prejudice as shown in the Status of the Claims section, *infra*. No new matter has been added. Additions are underlined and deletions are struckthrough.

Claim 24 has been amended to include subject matter previously recited in claim 26, which recites allowable subject matter. Claim 26 has been amended to include subject matter disclosed in the Specification between lines 1 and 6 on page 5.

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STATUS OF THE CLAIMS

1-12 (Canceled).

13. (Original) A method for fabricating a silicon photodetector assembly adapted for at least one frequency of light comprising the steps of:

providing a first body of silicon having a layer of silicon dioxide on a surface thereof;

providing a second body of silicon;

implanting hydrogen atoms at a predetermined depth in said silicon surface forming a boundary between hydrogen implanted silicon and unimplanted silicon;

bonding a silicon surface of said second body to the silicon dioxide layer of the first body;

separating the hydrogen implanted silicon from silicon not hydrogen implanted at said boundary thereby exposing a separated surface;

providing a further body of silicon having a layer of silicon dioxide thereon;

implanting hydrogen atoms at a predetermined depth in said further body forming a boundary between hydrogen implanted silicon and unimplanted silicon;

bonding the silicon dioxide layer of said further body to said exposed silicon surface;

separating the hydrogen implanted silicon from silicon not hydrogen implanted at said boundary of said further body thereby exposing a separated surface thereof;

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doping said further body near the separated surface to create a first semiconducting region of one of p and n types;

providing a silicon layer on the separated surface of said further body to form a cavity for light coupled into the silicon layer from a light admitting surface thereof; and

doping said silicon layer near the light admitting surface to create a second semiconducting region of type opposite to the type of said first semiconducting region.

14. (Original) The method of claim 13 further including the steps of repeating the last mentioned further body providing, implanting, bonding, and separating steps one or more times.

15. (Original) The method of claim 13 wherein said bonding step includes the step of heating the hydrogen implanted body to promote cleaving or fracturing at regions containing hydrogen.

16. (Original) The method of claim 15 wherein said heating step includes heating to a cleaving temperature followed by heating to a bond strengthening temperature.

17. (Original) The method of claim 16 wherein said cleaving temperatures and strengthening temperatures are respectively approximately 600 degrees C and 1000 degrees C.

18. (Original) The method of claim 13 wherein the step of providing a silicon layer includes the step of growing an epitaxial layer on the silicon fractured at said boundary.

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19. (Original) The method of claim 13 wherein said step of providing a silicon layer includes the step of providing a first semiconducting layer adjacent said boundary.

20. (Original) The method of claim 19 wherein said step of providing a silicon layer includes the step of providing a light admitting second semiconductor layer at an outer surface thereof.

21. (Original) The method of claim 20 further including the step of providing conducting connections to said each of first and second layers.

22. (Original) The method of claim 21 further including the step of biasing said conducting connections.

23. (Original) A photodetector assembly manufactured according to the method of claim 13.

24. (Currently amended) A method for fabricating a plurality of buried reflective layers comprising alternating layers of silicon and silicon dioxide adapted for at least one frequency of light, comprising the steps of:

providing a first body of silicon having a layer of silicon dioxide on a surface thereof;

providing a second body of silicon;

implanting hydrogen atoms to a predetermined depth in said silicon surface forming a first boundary between hydrogen implanted silicon and unimplanted silicon on either side thereof;

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bonding a silicon surface of said second body to the silicon dioxide layer of the first body by heating the hydrogen implanted body to promote bonding and cleaving or fracturing of regions containing hydrogen from regions not containing hydrogen, wherein a first heating step to a cleaving temperature is followed by a second heating step to a bond strengthening temperature;

separating the silicon at the first hydrogen boundary thereby exposing a separated surface;

providing a further body of silicon having a layer of silicon dioxide thereon;

implanting hydrogen atoms to a predetermined depth in said further body forming a second boundary between hydrogen implanted silicon and unimplanted silicon on either side thereof;

bonding the silicon dioxide layer of said further body to said exposed silicon surface to provide alternating layers of silicon and silicon dioxide; ~~and~~

separating the silicon at the second hydrogen boundary thereby exposing a second separated surface; and

providing a silicon epitaxial layer on the silicon fractured at said second hydrogen boundary.

25. (Original) A method for fabricating a buried reflective layer in silicon of claim 24 wherein said cleaving temperatures and strengthening temperatures are respectively approximately 600 degrees C and 1000 degrees C.

26. (Currently amended) A method for fabricating a buried reflective layer in silicon of claim 24~~25~~ wherein~~further including~~ the step of providing a silicon epitaxial layer on the silicon

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fractured at said second hydrogen boundary includes first providing an n-type semiconductivity to the silicon fractured at said second hydrogen boundary.

27-31 (Canceled).

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